

SEQUENCE LISTING

(1) GENERAL INFORMATION

- 71280X
- (i) APPLICANT: Peterson, et al.
- (ii) TITLE OF THE INVENTION: METHODS FOR GENERATING AND SCREENING NOVEL METABOLIC PATHWAYS
- (iii) NUMBER OF SEQUENCES: 51
- (iv) CORRESPONDENCE ADDRESS:
- (A) ADDRESSEE: Pennie & Edmonds
 - (B) STREET: 1155 Avenue of the Americas
 - (C) CITY: New York
 - (D) STATE: NY
 - (E) COUNTRY: USA
 - (F) ZIP: 10036/2711
- (v) COMPUTER READABLE FORM:
- (A) MEDIUM TYPE: Diskette
 - (B) COMPUTER: IBM Compatible
 - (C) OPERATING SYSTEM: DOS
 - (D) SOFTWARE: FastSEQ Version 2.0
- (vi) CURRENT APPLICATION DATA:
- (A) APPLICATION NUMBER: 08/738,944
 - (B) FILING DATE: 24-OCT-1996
 - (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
- (A) APPLICATION NUMBER: USSN 08/639,255
 - (B) FILING DATE: 24-APR-1996
- (viii) ATTORNEY/AGENT INFORMATION:
- (A) NAME: Coruzzi, Laura A
 - (B) REGISTRATION NUMBER: 30,742
 - (C) REFERENCE/DOCKET NUMBER: 8757-007
- (ix) TELECOMMUNICATION INFORMATION:
- (A) TELEPHONE: 212-790-9090
 - (B) TELEFAX: 212-869-8864
 - (C) TELEX: 66141 PENNIE

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 23 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (ix) FEATURE:
- (A) NAME/KEY: Oligonucleotide "Bead-link-5"
 - (B) LOCATION: 1...23
 - (D) OTHER INFORMATION:
- (A) NAME/KEY: Other
 - (B) LOCATION: 1
 - (D) OTHER INFORMATION: Biotin at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

GCCGACCATT TAAATCGGTT AAT

23

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Oligonucleotide "Bead-link-3"
- (B) LOCATION: 1...21
- (D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

TAACCGATTT AAATGGTCGG C

21

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Annealed beadlink oligonucleotide
- (B) LOCATION: 1...44
- (D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 8...15, 31...38

(D) OTHER INFORMATION: SmaI restriction
endonuclease sites

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GCCGACCATT TAAATCGGTT AATCGGCTGG TAAATTTAGC CAAT

44

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: BstXI site

(B) LOCATION: 1...12

129

(D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

CCACCTAACT GG

12

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAGTAGATCT CTCGAGCGGC

20

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GCCGCTCGAG AGATCTACTC

20

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Promoter for cDNA and gDNA inserts

(B) LOCATION: 1...6
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GATCTC

6

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Promoter for cDNA and gDNA inserts
(B) LOCATION: 1...6
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

TCGAGA

6

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Promoter for cDNA and gDNA inserts
(B) LOCATION: 1...8
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Promoter site

131

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GATCTCTC

8

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GATCCCCGGG GGATCCCCGGC

20

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator for cDNA inserts
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

GCCGGGATCC CCCGGGGATC

20

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Terminator for cDNA inserts

(B) LOCATION: 1...15

(D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 5...6

(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

CCGGGGGATC CCGGC

15

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Terminator for cDNA inserts

(B) LOCATION: 1...11

(D) OTHER INFORMATION:

(A) NAME/KEY: Other

(B) LOCATION: 10...11

(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

GCCGGGATCC C

11

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 13 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Terminator for cDNA inserts

(B) LOCATION: 1...13

133

(D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

GCCGGGATCC CCC

13

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CGGCCTCGAG GGATCCCGGC

20

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...20
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

GCCGGGATCC CTCGAGGCCG

20

134

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...15
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

TCGAGGGATC CCGGC

15

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...11
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GCCGGGATCC C

11

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

135

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Terminator
- (B) LOCATION: 1...13
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GCCGGGATCC CTC

13

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: cDNA inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GATCCGC

7

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: cDNA inserts

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

GGCCGCGGA

9

(2) INFORMATION FOR SEQ ID NO:22:

136

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 5...6
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other

- (B) LOCATION: 1

- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GATCCGCGG

9

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: cDNA gene cassettes
- (B) LOCATION: 1...32
- (D) OTHER INFORMATION:

- (A) NAME/KEY: Other

- (B) LOCATION: 5...6

- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other

- (B) LOCATION: 13...14

- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other

- (B) LOCATION: 22...23

- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

GATCTCTCGA TCCGCGGCCG GGGGATCCCG GC

32

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 28 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: cDNA gene cassettes
(B) LOCATION: 1...28
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 10...11
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other
(B) LOCATION: 19...20
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 27...28
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

GCCGGGATCC CCCGGCCGCG GATCGAGA

28

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Gene fragments
(B) LOCATION: 1...6
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: gDNA inserts

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

GATCCG

6

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Gene fragments
(B) LOCATION: 1...6
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: gDNA inserts

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

GATCCG

6

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Gene fragments
(B) LOCATION: 1...8
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GATCCGGA

8

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: cDNA gene cassettes
(B) LOCATION: 1...31
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Promotor site

(A) NAME/KEY: Other
(B) LOCATION: 13...14
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 21...22
(D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GATCTCTCGA TCCGGATCGA GGGATCCCGG C

31

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: cDNA gene cassettes
(B) LOCATION: 1...27
(D) OTHER INFORMATION:

(A) NAME/KEY: Other
(B) LOCATION: 10...11
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other
(B) LOCATION: 18...19
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 26...27
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

GCCGGGATCC CTCGATCCGG ATCGAGA

27

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 33 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Other
(B) LOCATION: 6...7
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other
(B) LOCATION: 14...15
(D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 23...24
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

GGATCTCTCG ATCCGCGGCC GGGGGATCCC GGC

33

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 19...20
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 27...28
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GCCGGGATCC CCCGGCCGCG GATCGAGAGA TCC

33

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GGATCTCTCG ATCCGGATCG AGGGATCCCG GC

32

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 10...11
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 18...19
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 26...27
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GCCGGGATCC CTCGATCCGG ATCGAGAGAT CC

32.

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23
- (D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GGATCTCTCG ATCCGGATCG AGG

23

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid

(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA
(ix) FEATURE:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other
(B) LOCATION: 13...14
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 21...22
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

GATCCCTCGA TCCGGATCGA GAGATCC

27

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 67 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA
(ix) FEATURE:

(A) NAME/KEY: Other
(B) LOCATION: 6...7, 28...29, 50...51
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other
(B) LOCATION: 14...15, 36...37, 58...59
(D) OTHER INFORMATION: Methylated site

(A) NAME/KEY: Other
(B) LOCATION: 22...23, 44...45, 66...67
(D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCT CTCGATCCGG
ATCGAGG

60
67

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 71 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA
(ix) FEATURE:

143

(A) NAME/KEY: Other
(B) LOCATION: 1
(D) OTHER INFORMATION: Phosphate at nucleotide 1

(A) NAME/KEY: Other
(B) LOCATION: 5...6, 27...28, 49...50
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other
(B) LOCATION: 13...14, 35...36, 57...58
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 21...22, 43...44, 65...66
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GATCCCTCGA TCCGGATCGA GAGATCCCTC GATCCGGATC GAGAGATCCC TCGATCCGGA 60
TCGAGAGATC C 71

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 69 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(A) NAME/KEY: Other
(B) LOCATION: 6...7, 28...29, 50...51
(D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other
(B) LOCATION: 14...15, 36...37, 58...59
(D) OTHER INFORMATION: Methylated site

(A) NAME/KEY: Other
(B) LOCATION: 22...23, 44...45, 66...67
(D) OTHER INFORMATION: Terminator site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCT CTCGATCCGG 60
ATCGAGGGA 69

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 13 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Other
(B) LOCATION: 5...6
(D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

TCGAGCCAGC TAA

13

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

(A) NAME/KEY: Other

(B) LOCATION: 1

(D) OTHER INFORMATION: Phosphate at nucleotide 1

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

CTGGCTC

7

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 60 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7, 28...29
- (D) OTHER INFORMATION: Promoter site

(A) NAME/KEY: Other

(B) LOCATION: 14...15, 36...37

(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other

(B) LOCATION: 22...23, 44...45

(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other

(B) LOCATION: 52...53

(D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GGATCTCTCG ATCCGGATCG AGGGATCTCT CGATCCGGAT CGAGGGATCG AGCCAGCTAA

60

(2) INFORMATION FOR SEQ ID NO:42:

145

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 56 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 12...13, 34...35
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 20...21, 42...43
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

CTGGCTCGAT CCCTCGATCC GGATCGAGAG ATCCCTCGAT CCGGATCGAG AGATCC

56

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 62 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 6...7, 29...30
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15, 37...38
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 23...24, 46...47
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 54...55
- (D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

a1

146

GGATCTCTCG ATCCGCGGCC GGGGGATCTC TCGATCCGCG GCCGGGGGAT CGAGCCAGCT
AA

60
62

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 58 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 12...13, 35...36
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 21...22, 44...45
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 29...30, 52...53
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

CTGGCTCGAT CCCCCGCGCG CGGATCGAGA GATCCCCCGG CCGCGGATCG AGAGATCC

58

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 68 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 14...15, 36...37
- (D) OTHER INFORMATION: Promoter site

- (A) NAME/KEY: Other
- (B) LOCATION: 22...23, 44...45
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other

a

147

- (B) LOCATION: 30...31, 52...53
- (D) OTHER INFORMATION: Terminator site
- (A) NAME/KEY: Other
- (B) LOCATION: 60...61
- (D) OTHER INFORMATION: pDbLET Vector

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

GGTAGCGAGG ATCTCTCGAT CCGGATCGAG GGATCTCTCG ATCCGGATCG AGGGATCGAG
CCAGCTAA

60
68

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 68 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

- (A) NAME/KEY: Other
- (B) LOCATION: 4...5
- (D) OTHER INFORMATION: pDbLET Vector

- (A) NAME/KEY: Other
- (B) LOCATION: 12...13, 34...35
- (D) OTHER INFORMATION: Terminator site

- (A) NAME/KEY: Other
- (B) LOCATION: 20...21, 42...43
- (D) OTHER INFORMATION: Methylated inserts

- (A) NAME/KEY: Other
- (B) LOCATION: 28...29, 50...51
- (D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

CTGGCTCGAT CCCTCGATCC GGATGGAGAG ATCCCTCGAT CCGGATGGAG AGATCCGGGC
TACCTTAG

60
68

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 68 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

- (A) NAME/KEY: Other
- (B) LOCATION: 1
- (D) OTHER INFORMATION: Phosphate at nucleotide 1

(A) NAME/KEY: Other
(B) LOCATION: 4...5
(D) OTHER INFORMATION: pDbLET Vector

(A) NAME/KEY: Other
(B) LOCATION: 12...13, 34...35
(D) OTHER INFORMATION: Terminator site

(A) NAME/KEY: Other
(B) LOCATION: 20...21, 42...43
(D) OTHER INFORMATION: Methylated inserts

(A) NAME/KEY: Other
(B) LOCATION: 28...29, 50...51
(D) OTHER INFORMATION: Promoter site

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CTGGCTCGAT CCCTCGATCC GGATCGAGAG ATCCCTCGAT CCGGATGGAG AGATCCGGGC 60
TACCTTAG 68

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Oligomer
(B) LOCATION: 1...29
(D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

CCTAGCCATG GCCACCTAAC TGGGATCGC 29

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 37 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: Oligomer
(B) LOCATION: 1...37
(D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

GGCCGCGATC CCAGTTAGGT GGCCATGGCT AGGAGCT 37

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 262 amino acids
(B) TYPE: amino acid

149

(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein
(ix) FEATURE:

(A) NAME/KEY: CXC-AMN20
(B) LOCATION: 1...262
(D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

Asn Ser His Phe Ile Ile Thr Thr Gln Gly Val Leu Val Phe Asp Ser
1 5 10 15
Gly Ser Ser Glu His Ile Gly Asn Ala Ile Ile Ala Ala Val Lys Arg
20 25 30
Val Thr Glu Gln Pro Ile Arg Trp Val Val Asn Ser His Ser His Ala
35 40 45
Asp His Trp Leu Gly Asn Ala Ala Leu Ala Lys Leu Gly Ala Glu Leu
50 55 60
Ile Ser Thr Ser Leu Ser Ala Glu Thr Met Lys Ser Asp Gly Pro Val
65 70 75 80
Asp Val Lys Ala Phe Phe Asn Met Thr Lys Gly Ala Thr Gly Glu Ser
85 90 95
Thr Leu Val Ile Pro Thr Ser Ile Ile Leu His Gln Gln Thr Arg Thr
100 105 110
Phe Gly Asp Thr Glu Val Glu Phe Val Phe Ala Asn Asp Gly His Ser
115 120 125
Pro Gly Asp Val Met Leu Trp Leu Pro Lys Gln Arg Ile Leu Ile Gly
130 135 140
Gly Asp Val Val Asn Ser Asn Phe Met Pro Ile Met Thr Pro Arg Gly
145 150 155 160
Asn Ile Thr Gln Leu Ile Ser Val Leu Lys Glu Val Glu Gln Leu Ser
165 170 175
Pro Leu Leu Val Leu Thr Gly His Gly Glu Asn Thr Ser Val Lys Ser
180 185 190
Val Ser Arg Asp Ile Gln Phe Leu Thr Tyr Ala Ser Asn Ala Val His
195 200 205
Glu Ala Leu Val Lys Gly Thr Thr Pro Ala Lys Ile Gln Ala Ser Leu
210 215 220
Gln Ala Thr Leu Arg Thr Lys Phe Gly Lys Ala Tyr Gln Asp Phe Asp
225 230 235 240
Thr Ser Ile Ser Tyr Leu Leu Glu Met Met Ile Asp Lys Gln Arg Leu
245 250 255
Gln Phe Ser Pro Ile Thr
260

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 297 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein
(ix) FEATURE:

(A) NAME/KEY: Actinorhodin Dehydrase
(B) LOCATION: 1...297
(D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Met Thr Val Glu Val Arg Glu Val Ala Glu Gly Val Tyr Ala Tyr Glu

150

1 5 10 15
 Gln Ala Pro Gly Gly Trp Cys Val Ser Asn Ala Gly Ile Val Val Gly
 20 25 30
 Gly Asp Gly Ala Leu Val Val Asp Thr Leu Ser Thr Ile Pro Arg Ala
 35 40 45
 Arg Arg Leu Ala Glu Trp Val Asp Lys Leu Ala Ala Gly Pro Gly Arg
 50 55 60
 Thr Val Val Asn Thr His Phe His Gly Asp His Ala Phe Gly Asn Gln
 65 70 75 80
 Val Phe Ala Pro Gly Thr Arg Ile Ile Ala His Glu Asp Met Arg Ser
 85 90 95
 Ala Met Val Thr Thr Gly Leu Ala Leu Thr Gly Leu Trp Pro Arg Val
 100 105 110
 Asp Trp Gly Glu Ile Glu Leu Arg Pro Pro Asn Val Thr Phe Arg Asp
 115 120 125
 Arg Leu Thr Leu His Val Gly Glu Arg Gln Val Glu Leu Thr Cys Val
 130 135 140
 Gly Pro Ala His Thr Asp His Asp Val Val Val Trp Leu Pro Glu Glu
 145 150 155 160
 Arg Val Leu Phe Ala Gly Asp Val Val Met Ser Gly Val Thr Pro Phe
 165 170 175
 Ala Leu Phe Gly Ser Val Ala Gly Thr Leu Ala Ala Leu Asp Arg Leu
 180 185 190
 Ala Glu Leu Glu Pro Glu Val Val Val Gly Gly His Gly Pro Val Ala
 195 200 205
 Gly Pro Glu Val Ile Asp Ala Asn Arg Asp Tyr Leu Arg Trp Val Gln
 210 215 220
 Arg Leu Ala Ala Asp Ala Val Asp Arg Arg Leu Thr Pro Leu Gln Ala
 225 230 235 240
 Ala Arg Arg Ala Asp Leu Gly Ala Phe Ala Gly Leu Leu Asp Ala Glu
 245 250 255
 Arg Leu Val Ala Asn Leu His Arg Ala His Glu Glu Leu Leu Gly Gly
 260 265 270
 His Val Arg Asp Ala Met Glu Ile Phe Ala Glu Leu Val Ala Tyr Asn
 275 280 285
 Gly Gly Gln Leu Pro Thr Cys Leu Ala
 290 295